

## REMARKS

Applicants respectfully request reconsideration of the present application in view of the foregoing claim revisions and these comments.

### **I. Status of Claims**

Claims 1-4, 8, 9, 16, 17, 18, 20 and 21 are amended. Exemplary support for the amendment to claim 1 can be found on page 6, lines 11-13. Claims 2-4 are amended to comport with the amendments to claim 1. Exemplary support for the amendments to claim 16 can be found on page 6, line 8. Claim 17 is amended to comport the language with claim 16 in view of the change in dependency. Claims 8, 9, 18, 20 and 21 are amended to conform them to U.S. practice and/or to correct typographical errors. No new matter is added.

Claim 22 is added. Exemplary support can be found in claim 9. Again, no new matter is added.

Upon entry of this response, claims 1-6, 8, 9, and 16-22 will be pending and subject to examination on the merits, with claims 7 and 10-15 withdrawn.

### **II. Claims Rejections - 35 U.S.C. § 112, Second Paragraph**

Claims 16 and 17 stand rejected for alleged indefiniteness. In particular, the examiner contends that a number of recited terms and phrases recited render these claims unclear.

Without acquiescing to the propriety of the rejection, applicants have revised claims 16 and 17 such that they no longer recite the terms and phrases in question. Thus, the rejection is mooted and should be withdrawn.

### III. Claims Rejections – 35 U.S.C. § 103

Claims 1-6, 8-9 and 16-21 stand rejected for alleged obviousness over Marshall *et al.*, U.S. Patent No. 4,678,673, in view of Holley *et al.*, U.S. Patent No. 7,074,449. According to the examiner, Marshall “does not specifically mention lupine seeds,” and Holley is cited to remedy this deficiency. Applicants respectfully traverse this ground of rejection.

The rejection is premised on the faulty factual claim that “lupine seeds are inherently an oilseed.”<sup>1</sup> A skilled worker would not consider “lupine seeds” to be an oilseed, as disclosed by Marshall.

The expression “oilseed” refers to crops having seeds that contain sufficient amounts of oil so that the oil can be recovered and processed. (Exhibit A). The major world sources of edible seed oils are soy beans, sunflowers, rapeseed, cotton, and peanuts. (*Id.*). In addition, seed oils from flax (linseed) and castor beans are recovered. (*Id.*). Flax and castor oils, however, are not edible and are used for industrial purposes. (*Id.*).

Lupine seed is not an oilseed but rather a legume. WEBSTER’S NEW UNIVERSAL UNABRIDGED DICTIONARY, Barnes & Noble Publishing, Inc. (2003) (Exhibit B). A legume is a plant in the family *fabacea* or a fruit of these specific plants. *See* Exhibits C & D. Thus, “legume” is a botanical characterization. Legumes include crops that are oil-rich and, therefore, regarded as an “oilseed crops,” namely soy beans and peanuts, but not all legumes are oilseed crops.

The German Wikipedia excerpt for legumes, which is attached as Exhibit E, (a comparable one in English was not available) indicates the fat content of a number of legumes. Soy beans and peanuts, which are oilseed crops, contain 19% fat and 15% fat, respectively, but lupines contain only 4% fat.

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<sup>1</sup> Even if lupine was an “oilseed,” it is of no legal consequence. A genus does not necessarily anticipate or render obvious a species, and the examiner has not made the factual determinations necessary to support such a conclusion. *See, e.g.*, MPEP §§ 2131.02 & 2144.08.

Thus, Marshall's oilseed preparations do not teach or suggest the use of lupine seeds. Lupine is simply not considered an oilseed by those skilled in the art.

Marshall also does not suggest a protein preparation comprising "L-lactic acid" or a predominant amount of L-lactic acid. "[L]evorotatory L-lactic acid is known to be particularly valuable nutritionally, and therefore it is preferred that a large part, or all, of the lactic acid is present as L-lactic acid." Spec at page 6, line 13. Marshall merely discloses that a small amount of lactic acid was detected in the dried, fermented, full-fat soy. Marshall at 8:34-48. Marshall, however, makes no mention of the optical nature of the detected lactic acid, and it is pure speculation whether the lactic acid was "L-lactic acid" or predominantly L-lactic acid. Moreover, Marshall's lactic acid was probably not derived from soy-sugar breakdown, but "possibly from endogenous substrate utilization by the cells, after transfer to the soy medium." Marshall at 8:45-48. Accordingly, Marshall does not suggest providing a product containing the nutritionally valuable L-lactic acid in combination with diacetyl, and one of ordinary skill in the art would not have been successful in obtaining such a product using Marshall's fermentation methods.

Marshall states that "fermentation time is an important feature of the methods" and that "the fermentation should be carried out in less than 8 hours," preferably 3-6 hours. Marshall at 5:14-16. Beyond eight hours, contaminant levels in the slurry would become significant, thus adversely affecting final product flavor and texture. Marshall at 5:14-20. In contrast to this teaching, the fermentation time disclosed in the present application is rather long, resulting in protein preparations comprising a considerable amount of L-lactic acid. For example, the fermentation time for examples 2 to 5 was about 24 hours, and the protein preparations contained between 13.9 and 17.5 g/L L-lactic acid. Marshall's methods would not necessarily result in the recited amounts of lactic acid, therefore, and nothing in Marshall suggests increasing the amounts of L-lactic acid.

Marshall states that the full-fat aqueous oilseed slurry contains between 9-18% (w/v) of oilseed component to obtain a product that is not negatively affected by an off-flavor. Marshall at claim 1. Because the full-fat oilseed slurry must have the original distribution of

proteins, fats, and carbohydrates, the full-fat oilseed slurry would contain about 37% protein, based on the dry weight.

The claimed composition comprises “at least 60% protein from a plant source,” a relatively high protein amount. In contrast to the findings of Marshall with respect to a soy slurry, fermentation of a slurry obtained from lupine seed and comprising such a high protein content will result in a fermented product having a milk-product-like aroma and a considerable amount of L-lactic acid. At the same time, the fermented production will have no or almost no “beany” off-odor. See Spec. at paragraph bridging pages 7 and 8.

Thus, Marshall teaches fermentation of an oilseed, for example soy bean, while the claimed invention uses lupine seed, which is a typical proteinacious seed having a content of only about 5% fat, relative to the dry solids of the lupine seed. Marshall’s fermentation was done with a *lactobacillus*, namely *L. casei ssp. rhannosus*, which seems to be no *lactobacillus* at all because it does not produce lactic acid. Moreover, fermentation is made with broths having a low protein concentration. This is common in the art for soy bean because it is known that only a low concentration of protein in the broth will avoid the production of off-flavor. Finally, Marshall must avoid long fermentation times, which will negatively affect the production of lactic acid, if any. Therefore, Marshall discloses a method for the preparation of a product resulting in a product (a) made from sources other than those recited by the claims and (b) lacking the desired L-lactic acid.

Consequently, it was not obvious for one of ordinary skill in the art to arrive at the present invention, even if the Holley patent teaches processing alkaloid, oil, and protein preparations from protein-containing lupine seeds. Because Holley does not teach any fermentation at all, it would not be obvious for one of ordinary skill in the art that Holley’s protein level in the dry solids of more than 70% would be helpful in the production of a product as claimed. Indeed, Marshall teaches away from using such high protein content.

For at least these reasons, applicants respectfully request reconsideration and withdrawal of this ground of rejection.

**CONCLUSION**

Applicants submit that the present application is in condition for allowance, and they request and early indication to this effect. Examiner Caldwell is invited to contact the undersigned directly, should she feel that any issue warrants further consideration.

Respectfully submitted,

Date October 19, 2009

By 

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The Commissioner is hereby authorized to charge any additional fees, which may be required under 37 CFR §§ 1.16-1.17, and to credit any overpayment to Deposit Account No. 19-0741. Should no proper payment accompany this response, then the Commissioner is authorized to charge the unpaid amount to the same deposit account. If any extension is needed for timely acceptance of submitted papers, then Applicant hereby petitions for such extension under 37 CFR §1.136 and authorizes payment of the relevant fee(s) from the deposit account.

# EXHIBIT A

## Oilseed Crops

ARTICLE CONTENTS | [Links to Other Sites](#)

Oilseed Crops are grown primarily for the oil contained in the seeds. The oil content of small grains (eg. wheat) is only 1-2%; that of oilseeds ranges from about 20% for **SOYBEANS** to over 40% for **SUNFLOWERS** and rapeseed (**CANOLA**). The major world sources of edible seed oils are soybeans, sunflowers, rapeseed, cotton and peanuts. Seed oils from **FLAX** (linseed) and castor beans are used for industrial purposes. Edible fats and oils are similar in molecular structure; however, fats are solid at room temperature, while oils are liquid.

### KEYWORDS

OilSeed.Crops

Fats and oils are essential nutrients, comprising about 40% of the calories in the diet of the average Canadian. Edible vegetable oils are used as salad or cooking oils, or may be solidified (by a process called hydrogenation) to make margarine and shortening. These products supplement or replace animal products (eg. butter, lard), supplies of which are inadequate to meet the needs of an increasing world population.

While there are many uses for industrial vegetable oils, total world production is only about 3% of that of edible oils. Industrial applications are based on the properties of particular fatty-acid components of these oils. For example, flaxseed oil, rich in the unsaturated fatty acid linolenic, is a drying oil and is used in protective coatings (eg. paints, varnishes). Vegetable oils are used in putty, printing inks, erasers, coating or core oils, greases, plastics, etc. The residue remaining after the oil has been extracted from oilseeds is an important source of nutrients for farm animals. Oilseed meals from soybeans, peanuts, rapeseed and flaxseed are rich in protein; mixed with other ingredients (eg. cereal grains), they provide nutritionally balanced feeds.

The major oilseeds grown in Canada are soybeans, sunflowers, canola and flax. In addition, experimental production of peanuts on a commercial scale began in 1981 in southwestern Ontario. Plant breeding experiments are underway at the Agriculture Canada **RESEARCH STATION**, Saskatoon, Saskatchewan, to develop an edible oil from mustard seed and a usable animal feed from the residue. The program involves reducing the content of 2 harmful substances, erucic acid and glucosinolate, which were formerly a problem in rapeseed oil.

Soybeans require a relatively long growing season (100-140 days) and warm temperatures; hence, Canadian production is concentrated in southwestern Ontario. Sunflowers will tolerate a somewhat shorter (100-120 days), cooler growing season; most Canadian production occurs in southern Manitoba. Flax and canola are adapted to the relatively short, cool growing season of the Prairie provinces and most production occurs in that area. The size of the area of adaptation and the development of varieties with improved quality have permitted canola to become the major edible oilseed crop in Canada.

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### ARTICLE

# EXHIBIT B



# WEBSTER'S

NEW UNIVERSAL

# UNABRIDGED DICTIONARY

With definitions based on the  
*Random House Webster's Unabridged Dictionary, Second Edition*

BARNES  
& NOBLE  
BOOKS  
NEW YORK

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**CONCISE PRONUNCIATION KEY:** act, cāpe, dāre, pārt; æ as in *ære*, ðer, ðer, oil, bōk, bōt; out; up, ūge; child; s; that; zh as in *treasure*. e = a as in *alone*, e as in *easy*, o as in *gallop*, u as in *circus*; \* as in *fire* (fī); l and n can serve as syllabic consonants, as in *cradle* button (but/n). See the full key inside the front cover.

# EXHIBIT C

# Legume

From Wikipedia, the free encyclopedia

In botanical writing a **legume** is a plant in the family Fabaceae (or Leguminosae), or a fruit of these specific plants. A 'legume' fruit is a simple dry fruit that develops from a simple carpel and usually dehisces (opens along a seam) on two sides. A common name for this type of fruit is a "pod", although pod is also applied to a few other fruit types, such as vanilla. Well-known legumes include alfalfa, clover, peas, beans, lentils, lupins, mesquite, carob, soy, and peanuts.

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## History

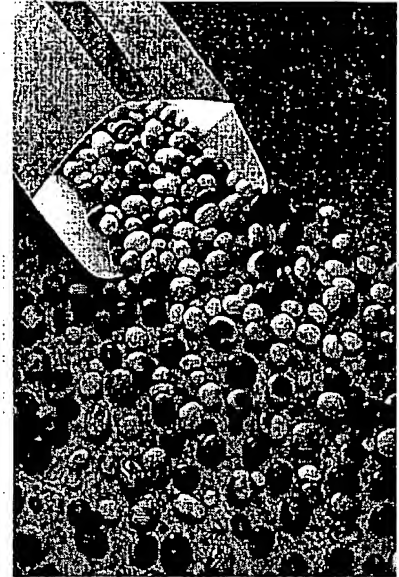
The term legume is derived from the Latin word *legumen* (with the same meaning as the English term), which is in turn believed to come from the verb *legere* "to gather." English borrowed the term from the French "légume," which, however, has a wider meaning in the modern language and refers to any kind of vegetable; the English word legume being translated in French by the word légumineuse.

The history of legumes is tied in closely with that of human civilization, appearing early in Asia, the Americas (the common *Phaseolus* bean in several varieties), and Europe (broad beans) by 6,000 BC, where they became a staple, essential for supplementing protein where there was not enough meat.

## Fixation of nitrogen in the soil

Legume plants are notable for their ability to fix atmospheric nitrogen, thanks to a symbiotic relationship with certain bacteria known as rhizobia found in root nodules of these plants. The ability to form this symbiosis reduces fertilizer costs for farmers and gardeners who grow legumes, and allows legumes to be used in a crop rotation to replenish soil that has been depleted of nitrogen. The nitrogen fixation ability of legumes is enhanced by the availability of calcium in the soil and reduced by the presence of ample nitrogen.

Legume seed and foliage have a comparatively higher protein content than non-legume material, probably due to the additional nitrogen that legumes receive through nitrogen-fixation symbiosis. This high protein content makes them desirable crops in agriculture.



Varieties of soybean seeds, a popular legume



Pea pods

# EXHIBIT D

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# Legume Family (Fabaceae)

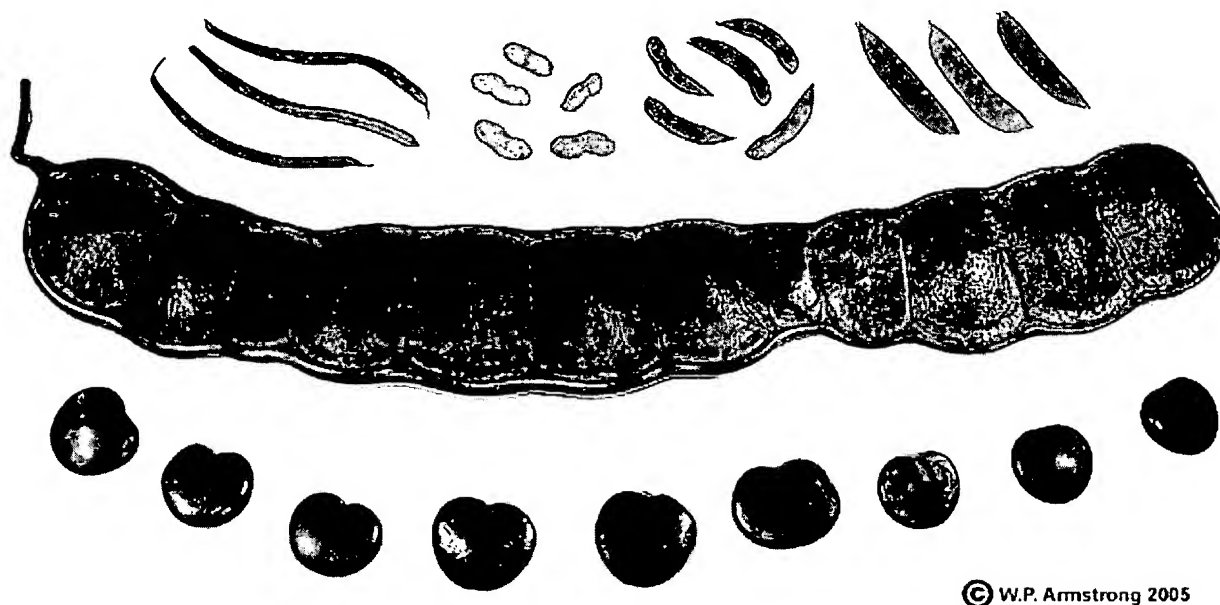
## Third Largest Plant Family On Earth



A sun-bleached "mape" or Tahitian chestnut (*Inocarpus fagiferus*) washed ashore on the island of Tetiaroa. The specific epithet is also spelled **fagifer**. This tree is widespread in the South Pacific, from Java and Papua New Guinea throughout numerous Melanesian and Polynesian islands. It grows in coastal forests and along the edges of mangrove swamps. The distinctive, massive trunk is buttressed and irregularly fluted. The cooked seeds are an important food source for indigenous people of this large tropical region. The seeds reportedly have a flavor similar to chestnuts. Grated seeds are used for making cakes, breads and puddings.

The legume family (Fabaceae) is the third largest family of flowering plants with more than 18,000 described species. It is surpassed in size only by the orchid family (Orchidaceae) with about 20,000 species and the sunflower family (Asteraceae) with about 24,000 species. The family includes herbs, shrubs, trees and vines distributed throughout

the world, especially the tropical rain forest. The fruit is technically called a legume or pod. It is composed of a single seed-bearing carpel that splits open along two seams. Legume fruits come in an enormous variety of shapes and sizes, including indehiscent pods that do not split open. Of all the legumes, the peanut is especially fascinating because it develops below the ground.



The world's largest legume fruits (bean pods) are produced by the tropical liana **Entada**. The longest pods of the Central American **E. gigas** may be up to 5 feet long (1.5 m). This gigantic woody vine is truly like Jack's fabulous bean stalk. In Costa Rica it is called "monkey ladder" or "escalera de mono." The woody seeds of **E. gigas** are called "sea hearts" and are often washed down streams to the sea where they drift across the ocean to distant continents. Familiar edible legume pods in the background include green beans, peanuts, soybeans and snow peas.

**Diversity of Flowering Plants**  
**The World's Longest Bean Pod**





The South American tipu tree (***Tipuana tipu***). Unlike the fruits of most members of the legume family, the unusual fruits have a distinctive wing that causes the legume to spin as it falls from the rain forest canopy. The tipu tree is commonly planted as a shade tree along streets in San Diego County. In fact, it lines the major thoroughfares at California State University, San Marcos.

**Seeds and Fruits Dispersed By Wind**

**T**he peanut (***Arachis hypogaea***) is native to central South America. By the time Columbus reached the New World, peanuts were already cultivated throughout warmer regions of the Americas. Peanuts have been introduced into Africa and Asian countries where they have become an important food crop. Like clover and alfalfa, the peanut root system contains nodules of nitrogen-fixing bacteria that convert inert atmospheric nitrogen into ammonia. Other bacteria convert the ammonia into nitrites and nitrates that enrich the soil with a usable form of nitrogen.

**Read About Nitrogen Fixation In Plants**

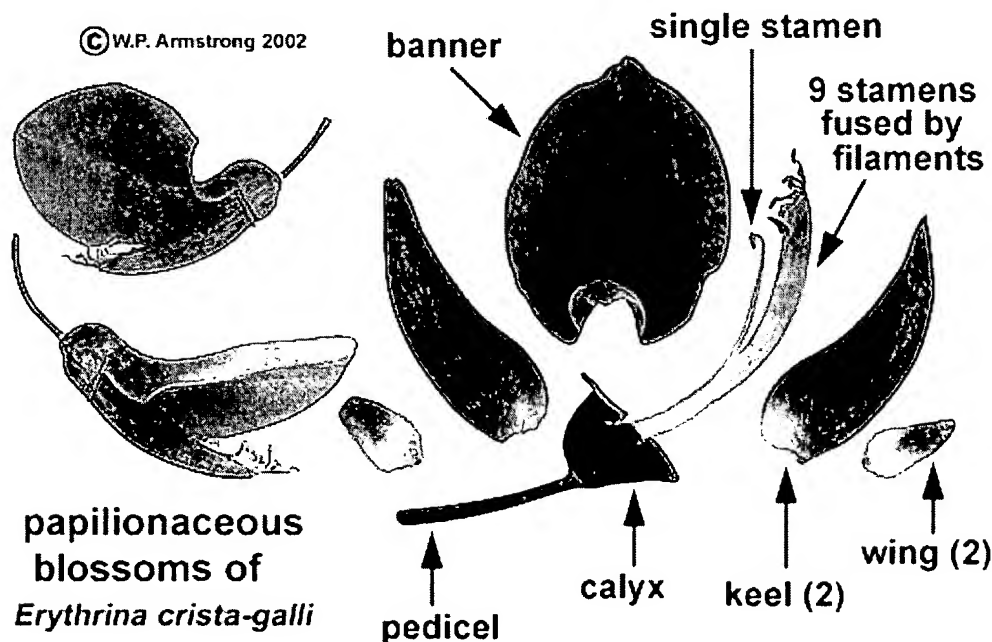
Like other members of the subfamily Papilionoideae, the peanut flower is papilionaceous, typical of a pea blossom. The peanut flower is produced on a slender stalk (pedicel) near the base of the plant. Each flower consists of five petals: a large banner, two lateral wings, and a keel formed by two fused petals. The keel petals enclose the 9 stamens (androecium) and pistil (gynoecium).

[More Information & Images About Peanuts](#)

### Three Subfamilies of the Legume Family

#### 1. Family Fabaceae--Subfamily Papilionoideae:

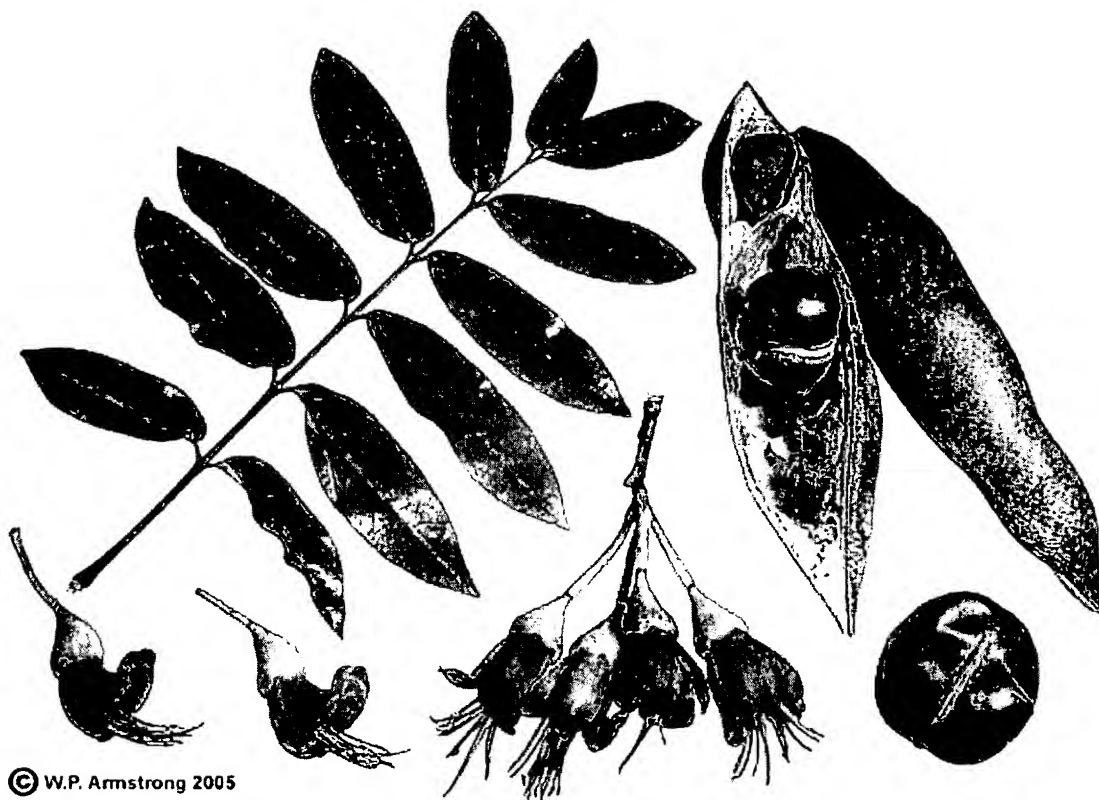
Members of the subfamily Papilionoideae have true papilionaceous flowers in which the upper petal is outside the lateral petals in the bud. This subfamily includes most members of the Fabaceae with typical pea-like flowrs, including **Dalea** (smoke tree), **Lupinus** (lupine), **Lathyrus** (sweet pea), **Erythrina** (coral tree), **Robinia** (black locust) and **Astragalus** (locoweed).



A dissected papilionaceous flower of **Erythrina crista-galli** showing all the major perianth segments removed from their attachment inside the calyx. The

five petals consist of one large, oval banner or standard, two elongate keel petals that are fused together enclosing the stamens, and two reduced wings. Nine stamen filaments are united into a sheath that surrounds the pistil. One stamen filament is separate from the fused nine, a condition referred to as diadelphous. A drop of nectar is secreted at the base of the petals inside the calyx. At maturity the banner is widely separated from the keel petals, thus making the nectar fluid at the base of the petals (within the calyx) readily available to short-billed perching birds. **Erythrina** species pollinated by hummingbirds have elongate, tubular blossoms.

See The Dissected Flower Of A Peanut  
The Pollination & Dispersal Of Coral Trees



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Moreton Bay chestnut (**Castanospermum australe**), a beautiful rain forest tree native to northeastern Australia and New Caledonia.



Moreton Bay chestnut (*Castanospermum australe*), an Australian rain forest tree.



Developing pod of Moreton Bay chestnut (*Castanospermum australe*)

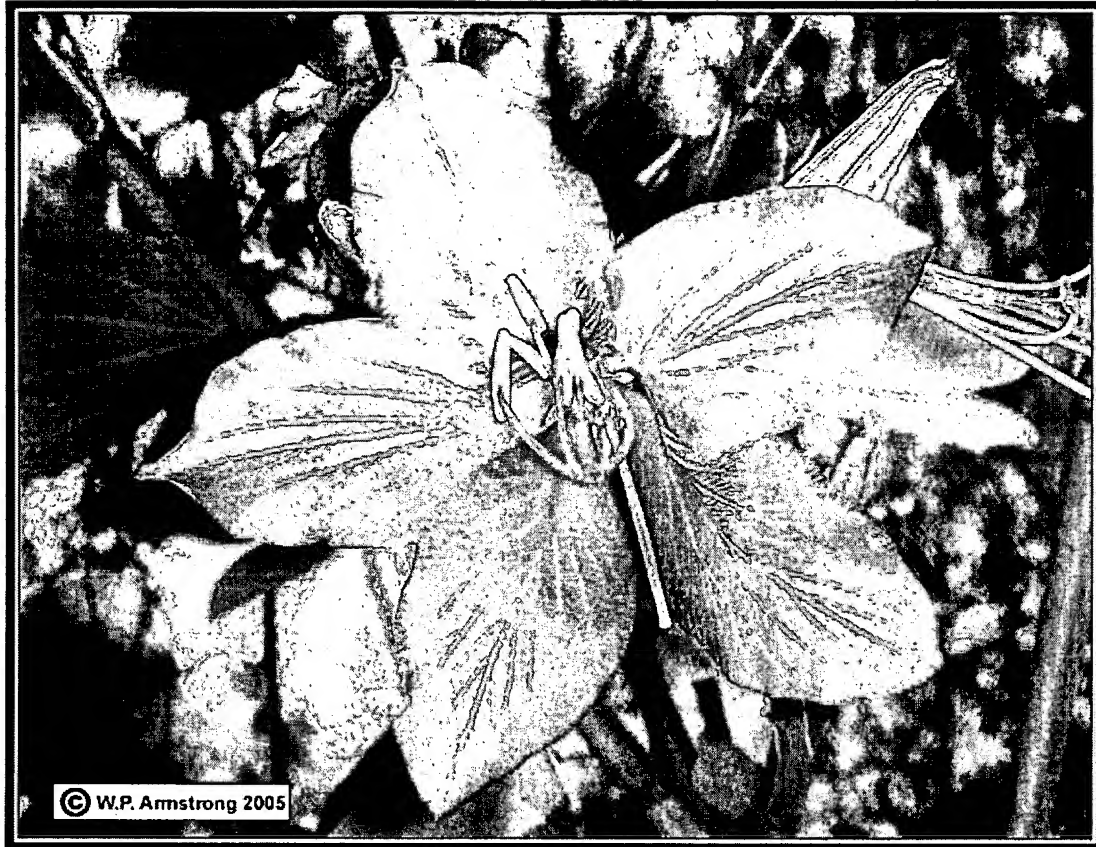


Immature pods of the Moreton Bay chestnut (*Castanospermum australe*).

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## 2. Family Fabaceae--Subfamily Caesalpinioideae:

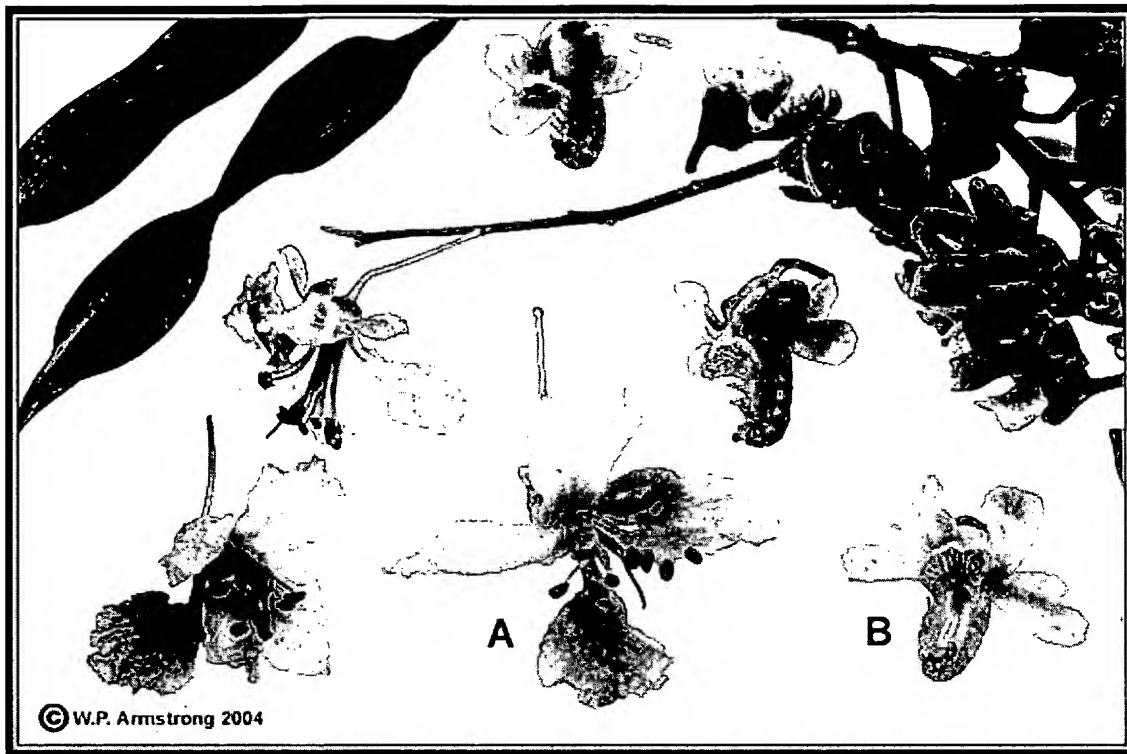
Members of the subfamily Caesalpinioideae have flowers that are bilateral, typically with five distinct petals, upper petal (banner) enveloped in the bud by the lateral wings. This subfamily includes **Cassia** (senna), **Cercis** (redbud), **Bauhinia** (orchid tree), **Cercidium** (palo verde), **Parkinsonia** (Jerusalem thorn), **Caesalpinia** (brazilwood), **Haematoxylum** (logwood), **Ceratonia** (carob), **Tamarindus** (tamarind) and **Delonix** (royal poinciana).



The Hong Kong orchid tree (***Bauhinia blakeana***) native to southern China. Although it is truly a legume, the flower is not papilionaceous. The upper petal is enveloped in the bud by the lateral wings.



***Bauhinia galpinii***, a shrubby species native to South Africa. The beautiful blossoms are brick red to orange. Although it is truly a legume, the flower is not papilionaceous. The upper petal is enveloped in the bud by the lateral wings.



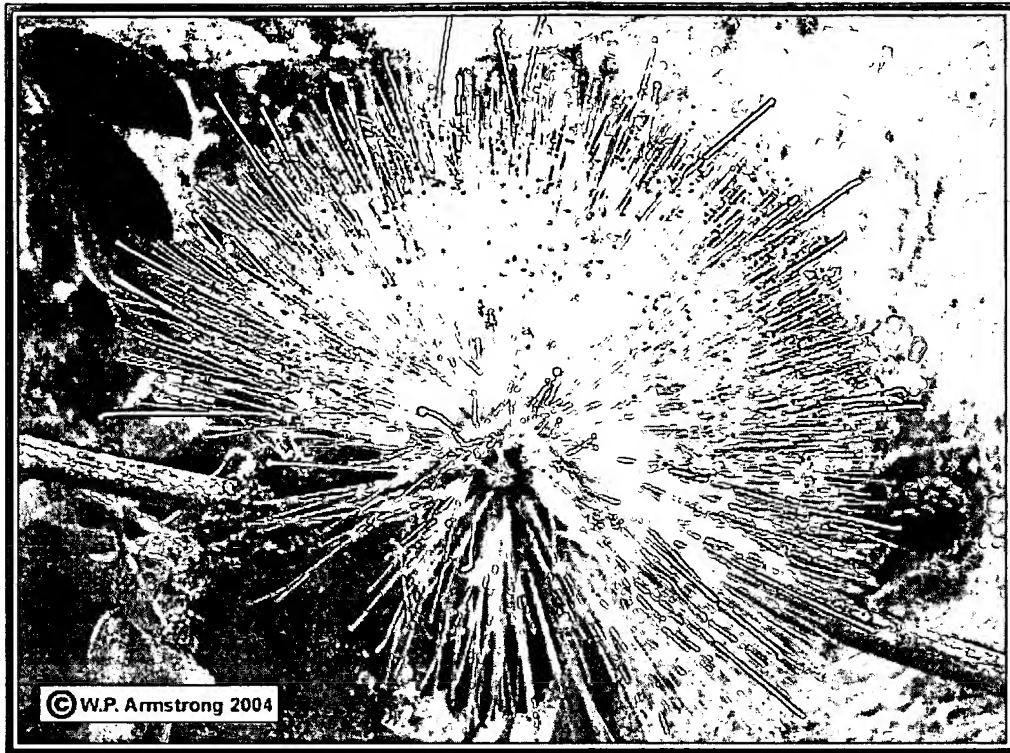
A. Jerusalem thorn or Mexican palo verde (*Parkinsonia aculeata*), a tree native to deserts of Arizona and Baja California. B. Brazilwood (*Caesalpinia echinata*), a tree native to Brazil and one of the important dyewoods of the 1600s. The flowers are bilateral (irregular) but not truly papilionaceous.

See Logwood and Brazilwood

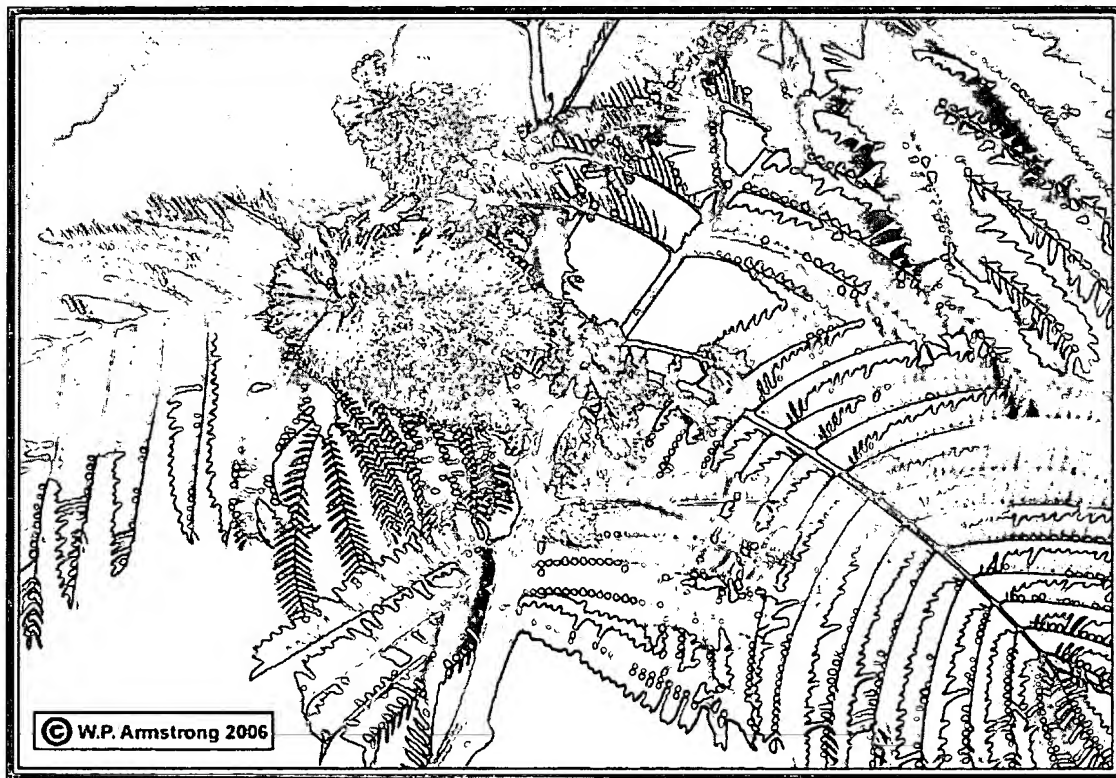
### 3. Family Fabaceae--Subfamily Mimosoideae:

Members of the subfamily Mimosoideae have flowers with radial symmetry, small, inconspicuous corollas and numerous, showy stamens. The flowers are typically in many-flowered heads or spikes. This subfamily includes *Acacia* (wattle), *Albizia* (silk tree), *Samanea* (monkeypod), *Prosopis* (mesquite) and *Calliandra* (powder puff).










Red powder puff (*Calliandra haematocephala*) native to Bolivia.



Plume albizia (*Albizia distachya*) native to Australia.

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# EXHIBIT E

Samen der Hülsenfrüchtler fast weltweit ein wichtiger Bestandteil der menschlichen Ernährung. Insbesondere bei fleischarmer oder vegetarischer Kost sind sie fast unverzichtbar. Beispiele sind etwa Erbsen, Kichererbsen, Bohnen, Azukibohnen, Limabohnen und Linsen, die zur Unterfamilie der Schmetterlingsblütler (Faboideae) gehören. Oft werden nur die Samen gegessen und umgangssprachlich werden dann die Samen - pars pro toto - meist „Hülsenfrüchte“ genannt. Bei beispielsweise grünen Bohnen und Zuckrerbsen werden die Früchte gegessen. Einige Hülsenfrüchte können auch roh gegessen werden (zum Beispiel Zuckrerbsen), viele sind im rohen Zustand aber gesundheitsschädlich und müssen vor dem Verzehr unbedingt eingeweicht und vollständig durchgegart werden.

**Die für die Ernährung wichtigsten Hülsenfrüchte mit ihrer mittleren chemischen Zusammensetzung von Nährstoffen (in Prozent).**

Fruchtart	Wasser	Proteine	Fette	Kohlenhydrate
Bohnen (grün)	82–90	2,5–6	0,3	6,5–8,5
Bohnen (reif)	11–14	24–26	1,5–2	47–55
Erbsen (grün)	80	2,5–6,5	0,5	4–12,5
Erbsen (reif)	14	23	2	53
Kichererbsen		20,5	4,8	61
Linsen	12	26	2	53
Sojabohnen	10	34	19	27
Erdnüsse	2	24	50	22
Lupinen	15	38	4	25

carbohydrates

⇐ soy beans  
⇐ peanuts  
⇐ lupines

Hülsenfrüchte enthalten neben den Eiweißen außerdem Kohlenhydrate, unter denen einige Mehrfachzucker die bekannten Blähungen verursachen.

Leguminosen werden auch in der Landwirtschaft verbreitet als Futtermittel für Wiederkäuer und Schweine eingesetzt.

Viele Arten liefern tropische Hölzer (Palisanderholz: *Dalbergia*- und *Machaerium*-Arten, *Sophora*-Arten). Als Forstpflanze in den gemäßigten Zonen angepflanzt wurde die Robinie und ist verwildert. Viele Arten und ihre Sorten werden als Zierpflanzen verwendet.

Die medizinische Wirkung wurde bei vielen Arten untersucht.

## Systematik

Die Familie umfasst etwa 730 Gattungen und fast 20.000 Arten. Sie wird in drei Unterfamilien und etwa 45 Tribus gegliedert (Gattungen siehe Unterfamilien):

- Schmetterlingsblütler (Faboideae): Mit etwa 476 Gattungen und etwa 13855 Arten. Sie besitzen die typischen, zygomorphen Schmetterlingsblüten.

■ Abreae	■ Coronilleae	■ Galegeae	■ Phaseoleae
■ Adesmieae	■ Crotalarieae	■ Genisteae	■ Podalyrieae
■ Aeschynomeneae	■ Cytiseae	■ Hedysareae	■ Psoraleae